

Int. Cl.: 65b

Federal Republic of Germany
German Patent Office

German Cl. 31a, 1

Disclosure 1586 328

File No.: P 15 86 328.2 (V 33759)
Application Date: June 1, 1967
Date of Disclosure: January 14, 1971

Description: Procedure to Relieve the Lateral Welding Seam

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Notification according to Article 71 §1, Paragraph 2, No. 1 of
the law dated 9/4/67 (BGBl IS.960):

Procedure to Relieve

The invention concerns a procedure to relieve the lateral welding seam subsequent to removal of the lateral sealing tools' molding pressure in a sleeve bag filling machine in which the goods to be packaged are shaped into a tube by a shaping collar and the goods to be packaged are moved in through a filling pipe which extends into the shaping collar.

The efficiency of a sleeve bag machine primarily depends on the time required to produce the lateral welding seam. The production of a lateral welding seam does not only include the time required for the welding process, but also the time to cool the lateral welding seam because the fresh welding seam cannot immediately be stressed.

Therefore, the known lateral seam welding devices have mechanical cooling elements in order to cool the lateral welding seam and to be able thereby to stress it sooner. Therefore, the efficiency of these mechanical cooling elements is relatively low because the heat radiating from the welding tools successively increases the temperature of these elements (DAS 1 187 980, England 835 306).

It is commonly known to create a vacuum in bags in order to protect the goods to be packaged from spoiling. In particular, a procedure is known according to which a forced air stream is created in the sleeve of a sleeve bag filling machine during lateral sealing or immediately before completing the sealing process, as is known from producing negative pressure, above the location of the seal and in the direction of the air to be suctioned from the bag. This

procedure, however, only allows removal of the excess air from the bag.

In addition, a filling pipe is known in machines of this type whose lower end may be closed by a flap. This filling pipe is enclosed by a ring space which is defined by an additional pipe which carries the foil track. This ring space is sealed on top and is connected to a vacuum source.

This device provides for the goods to be packaged to collect in measured form on the lower end of the filling pipe in order to have only a short fall to move into the sleeve bag after the above mentioned closing flap has been opened. While a certain relief of the lateral welding seam is achieved by the low height this serves primarily to reduce the dust by suction so that no dust particles get in between the lateral welding seam (GM 1 861 947).

The invention attempts to increase the efficiency of the sleeve bag machine.

The task of the invention is to relieve the lateral welding seam to the extent where cooling by mechanical parts is no longer necessary.

According to the invention this is achieved in that a vacuum is created with the start of the opening process until max. the beginning of the closing process of the lateral sealing tools in the half-finished bag. Under the atmospheric conditions in the half-finished bag the edge of the bottom seam, which has been relieved by the mechanical parts of the sealing tools, remains intact in its position for a certain period of time which is sufficient for cooling. The vacuum prevents the goods to be packaged from sliding immediately down to the fresh bottom seam. The timing of this slide to the bottom seam depends on the type and amount of the goods to be packaged and may be adjusted to the goods to be packaged by the duration of the vacuum. In this short time the bottom seam cools sufficiently so that the filled bag will no longer be ripped open when the lateral sealing tools move apart. This type of relief of the bottom seam may be used to advantage to increase the efficiency of the filling machine due to the fact that during the time when the lateral sealing seam in which the cooling occurs is relieved, the lateral sealing tools may already open again as opposed to the lateral sealing tools with cooling elements. The device for this procedure is characterized in that the walls of the filling pipe are provided with a suction pipe which extends into the inner part of the filling pipe, and above the filling pipe a disc is provided which may be swiveled and which covers the filling opening of the filling pipe when in operating position. This arrangement permits a safe working process of the machine with very little effort according to the procedure described. Another advantage of the invention is that the bottom seam is not surrounded by mechanical cooling parts immediately upon

completion of the lateral seam. According to another characteristic of the invention, this allows that an additional cooling air nozzle may be provided at the level of the lateral sealing tools which is directed at the bottom seam. This cooling air nozzle brings a cool air stream to the lateral seam and speeds up its cooling. This additional cooling effect may be used to advantage to increase the efficiency of the filling machine because the time frame from the production of the lateral welding seam to when it is stressed may be kept short.

The drawing explains the invention with a design example.

Shown are:

Fig. 1: a schematic side view

Fig. 2: the lateral sealing tools in operating position

Fig. 3: as above, in open position

Fig. 1 shows a sleeve bag filling machine schematically. The sleeve bag filling machine essentially consists of a filling funnel 1 with a filling pipe 2 positioned above a shaping collar 3. A foil track 4 leads over this shaping collar 3 so that a vertical hose is created. The foil track 4 is stocked up on a stocking roller 5 and before the shaping collar 3 it leads over a transport roller 6. Below the shaping collar 3 there are welding and transport tongs 7 and to the side there is a welding jaw 8 for the longitudinal seam. The welding and transport tongs 7 consist of two forklike clamp jaws 7a and 7b, and in the middle between the two a horizontal welding wire 9 is arranged. The welding and transport tongs 7 are placed against driving elements, which are not shown, which guarantee the clamp jaws 7a and 7b process of motion shown in line a.

In order to perform the procedure according to the invention some additional parts are provided on the sleeve bag filling machine. In the wall of the filling pipe 2 a suction pipe 10 is provided which extends into the inside of the filling pipe 2, and above the filling pipe 2 there is a disc 11, which when in operating position, covers the filling opening of the former. This disc 11 is attached on a lever arm 12, which is positioned on a vertical rod and can be swiveled. A mechanical drive, which is not shown, connects it with a cam on the single-speed shaft, also not shown. The equipment is completed by a cooling air nozzle 13 which is arranged at the height of the transport and welding tongs 7 in such a way that its opening is directed towards the bottom seam. This cooling air nozzle 13 is connected with a blower 14. The method of operation following the procedure according to the invention is described as follows:

Subsequent to the welding and transport tongs 7 returning from their lowest end position, shown as a dashed line, into the uppermost position, the clamp jaws 7a and 7b move towards each

other until they have firmly squeezed the foil sleeve together. Previously the longitudinal seam has already been welded with the aid of the welding jaw 8. Starting with this position of the clamp jaws 7 the relief of the lateral welding seam according to the invention will occur within one operating cycle of the sleeve bag filling machine. Here the disc 12 is still in its inactive position, i.e. it is swiveled away from the level of the filling opening.

At this point in time welding and separation of the lateral welding seam may start. For this reason the heated welding wire 9 is activated. The goods to be packaged, which have been moved into the sleeve, for instance hard candy B, do not immediately stress the fresh lateral seam because the clamp jaws 7a and 7b squeeze the two foils together. During this period the clamp jaws 7a and 7b move, while the foil is squeezed between them, to their lowest position. At the same time this movement of the welding and transport tongs 7 causes a new bag length to be pulled over the shaping collar 3. With the start of the opening process of the clamp jaws 7a and 7b in the half-finished bag a vacuum is created. This vacuum may be maintained until max. the beginning of the closing process. This vacuum in the half-finished bag is created by moving the disc 11 into its active position by ways of the cam, which is not shown, on the single-speed shaft and the mechanical drive. The disc 11 completely covers the filling opening of the filling pipe 2 and due to a vacuum source, which is not shown and which is connected with the filling pipe 2 through the suction pipe 10, a vacuum develops.

How this vacuum relieves the bottom seam after opening is shown particularly in Fig. 3. The candy is prevented from falling down on the bottom seam because the foil lies tightly against the contents. The edge which is exposed by the clamp jaws 7a and 7b initially remains intact. The lower, finished and filled bag falls downward after the clamp jaws 7a and 7b have been opened. Cooling the top seam on this bag is not required because not much stress is expected to occur there.

With the opening of the clamp jaws 7a and 7b the bottom seam is exposed so that the cooling air coming from the nozzle 13 fully hits the bottom seam and thereby creates an additional cooling effect. Before the clamp jaws 7a and 7b move together again in their upper position in order to produce the next lateral seam, the disc 12 is removed again from the area of the filling opening which immediately eliminates the vacuum. This is necessary because the bag has to be tightened again in order to obtain an impeccable lateral seam for the next bag.

Patent Claims

1. Procedure to relieve the lateral welding seam subsequent to removal of the lateral sealing tools' molding pressure in a sleeve bag filling machine in which the goods to be packaged are shaped into a tube by a shaping collar and the goods to be packaged are moved in through a filling pipe which extends into the shaping collar, characterized in that a vacuum is created in the half-finished bag with the start of the opening process until maximum the beginning of the closing process in the lateral sealing tools.
2. Equipment for the production of sleeve bag packaging according to the procedure in claim 1, characterized in that a suction pipe (10) is provided in the wall of the filling pipe (2) which extends into the inside of the filling pipe (2), and a disc (11) is provided above the filling pipe (2) which, in operating position, covers the filling opening of the filling pipe (2).
3. Equipment according to claim 2, characterized in that the disc (11) which covers the filling pipe (2) is attached to a lever arm (12) which is connected to the single-speed shaft of the sleeve bag machine by a mechanical drive.
4. Equipment according to claim 2, characterized in that the disc (11) which covers the filling pipe (2) may be operated from the single-speed shaft of the sleeve bag machine through a cam switch and an electromagnet.
5. Equipment according to claim 2, characterized in that at the level of the lateral sealing tools (7a; 7b) a cooling air nozzle (13) is provided additionally which is directed at the bottom seam.